

(12) UK Patent Application (19) GB (11) 2 242 860 (13) A

(43) Date of A publication 16.10.1991

(21) Application No 9104264.8

(22) Date of filing 28.02.1991

(30) Priority data
(31) 9004428 (32) 28.02.1990 (33) GB

(71) Applicants
Nigel John Middleton
Tregonce Cliff, Tregonce, St. Issey, Wadebridge,
Cornwall, PL27 7QJ, United Kingdom

Thomas Branigan Armstrong
Towan House, Towan, St. Merryn, Padstow, Cornwall,
United Kingdom

(72) Inventor
Nigel John Middleton

(74) Agent and/or Address for Service
Page & Co
Temple Gate House, Temple Gate, Bristol, BS1 6PL,
United Kingdom

(51) INT CL⁵

B32B 3/24, A41D 27/28 31/02, A61F 13/00, A62B 17/00

(52) UK CL (Edition K)

B5N N0324 N0526 N175 N176 N177 N180 N195
N196 N198 N207 N210 N223 N2510 N2516 N255
N267 N27X N295 N30X N319 N323 N401 N412
N413 N418 N42Y N46X N473 N491 N499 N50X
N515 N53X N53Y N530 N531 N537 N577 N58X
N58Y N589 N59Y N593 N599 N60X N648 N653
N658 N66Y N661 N670 N671 N672 N69X N764
N784

A5R RPC

U1S S1049 S1134 S1144 S1216 S1404 S1405
S2311 S2313 S3011 S3023 S3025

(56) Documents cited

GB 2202873 A GB 2175845 A GB 1598948 A
GB 1267712 A GB 1237127 A GB 1235224 A
EP 0052403 A EP 0018684 A

(58) Field of search

UK CL (Edition K) A5R RPC, B5N, D1K, D1R RBB
RBZ RGP
INT CL⁵ A41D, A61F, A62B, B32B, D04H

(54) Breathable fabric

(57) A breathable insulating fabric is described, from which wearable articles such as garments or medical support fabrics or dressings can be made, in which an elastomeric insulating sheet (1) has perforations (4) which have relatively wide (5) and narrow regions (6), (10) along their lengths to define an internal chamber 7 open to the inner side of the sheet as worn and sufficiently closed to the outer side of the sheet to permit air passing from the inner to the outer side of the sheet to accumulate in the chamber under increased pressure prior to passing to the outer side. The breathability of the fabric is adaptable to changes in the external conditions and the biological functions of the wearer.

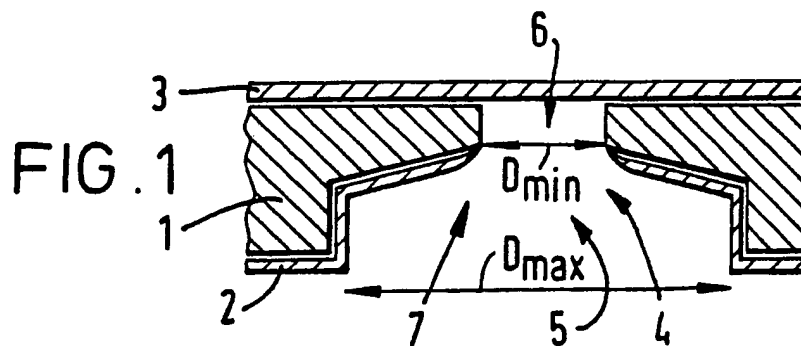
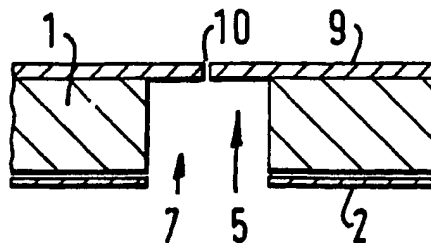


FIG. 3a



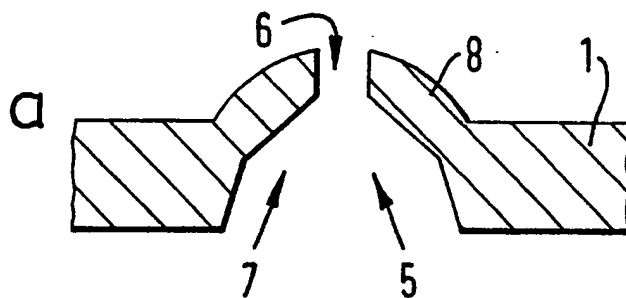
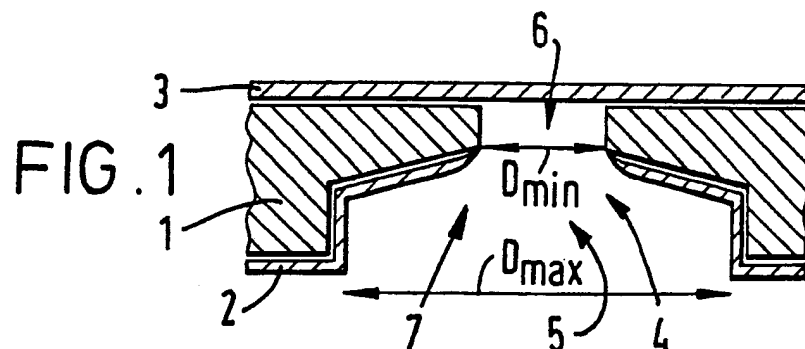


FIG. 2

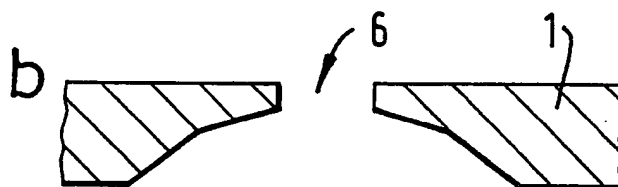
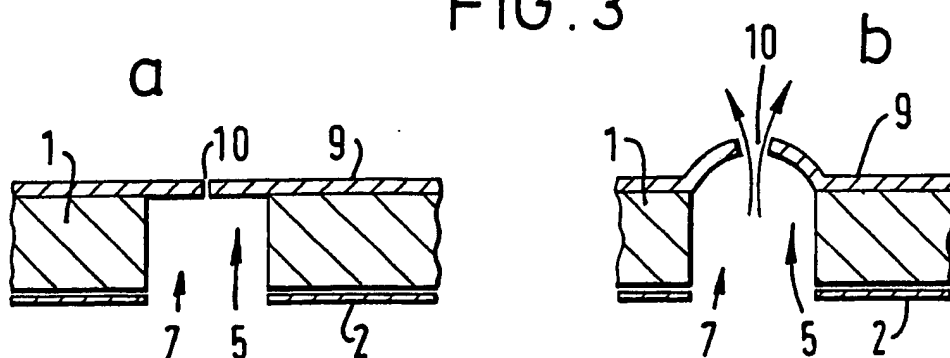


FIG. 3



-1-

FABRIC

The present invention relates to a novel fabric.

Insulating fabrics are known which comprise an impermeable, thermally efficient sheet material such as
5 neoprene rubber. Such fabrics are, however, not wearable next to the user's skin for extended periods of time, mainly due to the interference they can cause to the natural biological functions of the skin, in particular perfusion of the skin with oxygen and
10 removal of natural excretions such as water vapour, salt, urea and carbon dioxide.

Previous efforts to improve the wearability of impermeable materials have included perforation of the material and lamination with a more skin-compatible
15 material such as woven cotton.

British Patent No. 1267712, for example, describes (Fig. 4) a breathable fabric in which a perforated elastomeric sheet is bonded between stretch-fabric sheets. The diameter of the perforations reduces
20 slightly towards the outside of the finished garment to facilitate manufacture.

Such fabrics are reasonably wearable given normal external conditions and the biological functions of the wearer. However, if for example the wearer sweats or
25 warms up during exercise or under stress, or the external temperature or humidity rises or falls, or the fabric becomes soaked with water, or in other abnormal situations, the breathable efficiency of the fabric declines rapidly, which can make the garment extremely
30 uncomfortable or even dangerous to wear. Such poor adaptability has limited the use of breathable

elastomeric fabrics, for example for insulating and/or protective garments, for medical or veterinary garments and/or dressings (where the patient's skin may be injured or prolonged close contact with the skin may be required), or for exercise and sports garments where rapid changes of perspiration and other skin functions take place. The present invention aims to provide a breathable fabric which goes at least some way towards overcoming the above disadvantages.

- 10 According to the present invention, there is provided a fabric comprising a sheet formed of a substantially impermeable material having perforations provided therethrough, each perforation having at least one relatively wide region and at least one relatively narrow region along its length to define an internal chamber open to a first ("inner") side of the sheet and sufficiently closed to the other ("outer") side of the sheet to permit air passing from the first to the other side of the sheet to accumulate in the chamber under increased pressure prior to passing out to the other side of the sheet.

The expressions "relatively wide" and "relatively narrow" mean that the respective regions are wide and narrow relative to each other. The expression "fabric" includes a fabric portion, and the expression "sheet" includes a sheet portion.

The substantially impermeable sheet may be a unitary sheet or a laminate, and is preferably elastomeric (eg. formed from a rubber such as neoprene rubber). In the case of a laminate, different materials may if desired be used for different lamina so as to provide overall a sheet having the desired properties.